WEST Search History

DATE: Monday, March 10, 2003

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT,PGPB; PLUR=YES; OP=ADJ		
L3	(ebna1 or ebna-1 or bkrf1 or brkf-1) and (barf1 or barf-1)	3	L3
L2	L1 same (primer or probe)	38	L2
L1	(ebna1 or ebna-1) or (barf1 or barf1) or (bkrf1 or brkf-1)	431	L1

END OF SEARCH HISTORY

Proteins,specific or class...
    LMP-2 (latent-infection membrane protein 2), detection of gene for; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
Gene,microbial...
    LMP1, detection of; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
Gene,microbial...
    LMP2, detection of; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
Antigens...
    LYDMA, detection of gene for; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
Diagnosis...
    mol., of Epstein-Barr virus infection; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
Human herpesvirus 4... NASBA(nucleic acid sequence-based amplification)...
Primers(nucleic acid)...
    primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
Interleukin 10...
    viral, detection of gene for; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
  CAS REGISTRY NUMBERS:
219991-34-1 219991-38-5 219991-42-1 219991-43-2 242135-85-9 primer for detection BARF-1 gene of Epstein Barr virus; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
242135-86-0 242135-87-1 242135-88-2 242135-89-3 242135-99-5 primer for detection BCRF-1 gene of Epstein Barr virus; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
242135-90-6 242135-91-7 242135-92-8 242135-93-9 242136-00-1 primer for detection BDLF-2 gene of Epstein Barr virus; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
219990-89-3 219990-97-3 242135-80-4 242135-81-5 242135-82-6 242135-83-7 primer for detection EBER-1 RNA of Epstein Barr virus; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
219990-30-4 219990-43-9 219990-78-0 242135-72-4 242135-79-1 primer for detection EBNA-1 gene of Epstein Barr virus; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
219990-99-5 219991-00-1 219991-05-6 219991-13-6 242135-84-8 primer for detection LMP-1 gene of Epstein Barr virus; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
219991-18-1 219991-25-0 219991-31-8 219991-32-9 219991-33-0 primer for detection LMP-2 gene of Epstein Barr virus; primers for amplification and detection of Epstein Barr virus nucleic acid by NASBA
? s (barf1 or barf-1) and (epithelial or breast or nasopharyngeal or npc)
            147 BARF1
              0 BARF-1
         746772 EPITHELIAL
         824632 BREAST
          43828 NASOPHARYNGEAL
          13149 NPC
      S3   83 (BARF1 OR BARF-1) AND (EPITHELIAL OR BREAST OR NASOPHARYNGEAL OR NPC)
? rd s3
...examined 50 records (50)
...completed examining records
      S4   22 RD S3 (unique items)
? t s4/6/1-22

 4/6/1   (Item 1 from file: 5)

13534988 BIOSIS NO.: 200200163809
Hypothesis: A novel route for immortalization of **epithelial** cells by Epstein-Barr virus.
2002

4/6/2 (Item 2 from file: 5)
13310250 BIOSIS NO.: 200100517399
Growth transformation of primary **epithelial** cells with a **NPC** -derived Epstein-Barr virus strain.
2001

4/6/3 (Item 3 from file: 5)
12965681 BIOSIS NO.: 200100172830
N-terminal domain of **BARF1** gene encoded by Epstein-Barr virus is essential for malignant transformation of rodent fibroblasts and activation of Bcl-2.
2001

4/6/4 (Item 4 from file: 5)
12748457 BIOSIS NO.: 200000502080
Expression of **BARF1** gene encoded by Epstein-Barr virus in **nasopharyngeal** carcinoma biopsies.
2000

4/6/5 (Item 5 from file: 5)
12528497 BIOSIS NO.: 200000281999
Role of the Epstein-Barr virus Rta protein in activation of distinct classes of viral lytic cycle genes.
1999

4/6/6 (Item 6 from file: 5)
12522429 BIOSIS NO.: 200000275931
Unique transcription pattern of Epstein-Barr virus (EBV) in EBV-carrying gastric adenocarcinomas: Expression of the transforming **BARF1** gene.
2000

4/6/7 (Item 7 from file: 5)
11973916 BIOSIS NO.: 199900227229
Expression of Epstein-Barr virus (EBV) transcripts encoding homologues to important human proteins in diverse EBV associated diseases.
1999

4/6/8 (Item 8 from file: 5)
11708757 BIOSIS NO.: 199800490488
Nucleic acid sequence-based amplification, a new method for analysis of spliced and unspliced Epstein-Barr virus latent transcripts, and its comparison with reverse transcriptase PCR.
1998

4/6/9 (Item 9 from file: 5)
11295044 BIOSIS NO.: 199800076376
Expression of the protein encoded by Epstein-Barr virus (EBV) **BARF1** open reading frame from a recombinant adenovirus system.
1997

4/6/10 (Item 10 from file: 5)
11025142 BIOSIS NO.: 199799646287
Establishment of a monkey kidney **epithelial** cell line with the **BARF1** open reading frame from Epstein-Barr virus.
1997

4/6/11 (Item 11 from file: 5)
10745514 BIOSIS NO.: 199799366659
Antibody and antibody-dependent cellular cytotoxicity responses against the BamHI A rightward open-reading frame-1 protein of Epstein-Barr virus (EBV) in EBV-associated disorders.
1997

4/6/12 (Item 1 from file: 34)
08668991 Genuine Article#: 314MJ Number of References: 34
Title: Unique transcription pattern of Epstein-Barr virus (EBV) in EBV-carrying gastric adenocarcinomas: Expression of the transforming **BARF1** gene (ABSTRACT AVAILABLE)
Publication date: 20000515

4/6/13 (Item 2 from file: 34)
06651219 Genuine Article#: ZH268 Number of References: 60
Title: The Epstein-Barr virus **BARF1** gene encodes a novel, soluble colony-stimulating factor-1 receptor (ABSTRACT AVAILABLE)
Publication date: 19980500

4/6/14 (Item 3 from file: 34)
03058166 Genuine Article#: ND238 Number of References: 31
Title: EXPRESSION AND TUMORIGENICITY OF THE EPSTEIN-BARR-VIRUS **BARF1** GENE IN HUMAN LOUCKES B-LYMPHOCYTE CELL-LINE (Abstract Available)

4/6/15 (Item 4 from file: 34)
02084998 Genuine Article#: JZ811 Number of References: 24
Title: TRANSCRIPTIONAL EXPRESSION OF THE VIRAL GENOME IN THE EPSTEIN-BARR VIRUS-INDUCED TAMARIN LYMPHOMA AND THE CORRESPONDING LYMPHOBLASTOID TUMOR LINES (Abstract Available)

4/6/16 (Item 1 from file: 76)
02492243 4737903
Unique Transcription Pattern of Epstein-Barr Virus (EBV) in EBV-carrying Gastric Adenocarcinomas: Expression of the Transforming **BARF1** Gene
(2000)

4/6/17 (Item 2 from file: 76)
02217680 4231116
Expression of the protein encoded by Epstein-Barr virus (EBV) **BARF1** open reading frame from a recombinant adenovirus system
(1997)

4/6/18 (Item 1 from file: 98)
04273985 H.W. WILSON RECORD NUMBER: BGSA00023985 (USE FORMAT 7 FOR FULLTEXT)

Role of cytotoxic T lymphocytes in Epstein-Barr virus-associated diseases.
WORD COUNT: 11989
2000 (20000000)

4/6/19 (Item 1 from file: 144)
15110549 PASCAL No.: 01-0271038
N-terminal domain of **BARF1** gene encoded by Epstein-Barr virus is essential for malignant transformation of rodent fibroblasts and activation of BCL-2
2001

4/6/20 (Item 2 from file: 144)
13143960 PASCAL No.: 97-0403730
Establishment of a monkey kidney **epithelial** cell line with the **BARF1** open reading frame from Epstein-Barr virus
1997

4/6/21 (Item 1 from file: 155)
13115134 21983099 PMID: 11986715
Malignant transformation of monkey kidney **epithelial** cell induced by EBV **BARF1** gene and TPA]
Dec 2001

4/6/22 (Item 1 from file: 399)
DIALOG(R)File 399:(c) 2002 AMERICAN CHEMICAL SOCIETY. All rts. reserv.

Malignant transformation and immortalization assays in animal cells transfected with the BARF1 gene
? t s4/7/8-11, 13, 14, 17
>>>Format 7 is not valid in file 143

4/7/8 (Item 8 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2002 BIOSIS. All rts. reserv.

11708757 BIOSIS NO.: 199800490488
Nucleic acid sequence-based amplification, a new method for analysis of spliced and unspliced Epstein-Barr virus latent transcripts, and its comparison with reverse transcriptase PCR.
AUTHOR: Brink Antoinette A T P; Vervoort Marcel B H J; Middeldorp Jaap M; Meijer Chris J L M; Van Den Brule Adriaan J C(a)
AUTHOR ADDRESS: (a)Sect. Mol. Pathol., Dep. Univ. Hosp. Vrije Univ., P.O. Box 7057, 1007 MB Amsterdam**Netherlands
JOURNAL: Journal of Clinical Microbiology 36 (11):p3164-3169 Nov., 1998
ISSN: 0095-1137
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Nucleic acid sequence-based amplification (NASBA) assays were developed for direct detection of Epstein-Barr virus (EBV) transcripts encoding EBV nuclear antigen 1 (EBNA1), latent membrane proteins (LMP) 1 and 2, and BamHIA rightward frame 1 (**BARF1**) and for the noncoding EBV early RNA 1 (EBER1). The sensitivities of all NASBAs were at least

100 copies of specific in vitro-generated RNA. Furthermore, 1 EBV-positive JY cell in a background of 50,000 EBV-negative Ramos cells (the relative sensitivity) was detected by using the EBNA1, LMP1, and LMP2 NASBA assays. The relative sensitivity of the EBER1 NASBA was 100 EBV-positive cells, which was probably related to the loss of small RNA molecules during the isolation. The **BARF1** and LMP2 NASBAs were evaluated on clinical material. **BARF1** expression was found in 6 of 7 **nasopharyngeal** carcinomas (**NPC**) but in 0 of 22 Hodgkin's disease (HD) cases, whereas LMP2 expression was found in 7 of 7 NPCs and in 17 of 22 HD cases. For detection of EBNA1 transcripts in HLs (n = 12) and T- and B-cell non-Hodgkin's lymphomas (n = 3 and n = 2, respectively), NASBA was compared with reverse transcriptase (RT) PCR. Two samples were positive only with NASBA, and two other samples were positive only with RT-PCR; for all other samples, the RT-PCR and NASBA results were in agreement. We conclude that NASBA is suitable for sensitive and specific detection of the above-mentioned EBV transcripts, regardless of their splicing patterns and the presence of EBV DNA. The EBNA1, LMP2, and **BARF1** NASBAs developed in this study proved to be reliable assays for detection of the corresponding transcripts in EBV-positive clinical material.

4/7/9 (Item 9 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11295044 BIOSIS NO.: 199800076376
Expression of the protein encoded by Epstein-Barr virus (EBV) **BARF1** open reading frame from a recombinant adenovirus system.
AUTHOR: de Turenne-Tesser M(a); Jolicoeur P; Ooka T
AUTHOR ADDRESS: (a)Virol. Mol., UMR 5537 CNRS, Fac. Med., RTH Laennec, rue G. Paradin, 69372 Lyon Cedex 08**France
JOURNAL: Virus Research 52 (1):p73-85 Nov., 1997
ISSN: 0168-1702
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Epstein-Barr virus (EBV) has been associated with human cancers of lymphocytic or **epithelial** origin, but viral functions implied in oncogenesis are not yet clear. We previously reported the oncogenic transformation of rodent fibroblast and human B lymphocyte cell lines by the **BARF1** coding sequence from EBV. We more recently observed immortalizing effects of this gene on monkey kidney primary **epithelial** cells. Here we describe an efficient recombinant adenovirus expression system which allowed us to characterize **BARF1** translation products, with the help of rabbit polyclonal antibodies raised to the entire protein. The present data demonstrate that **BARF1** encodes a 31-33 kDa hydrophobic protein, linked to cell membranes though also recovered in the cytosol, and recognized by human sera from patients with various EBV-related pathologies.

4/7/10 (Item 10 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11025142 BIOSIS NO.: 199799646287
Establishment of a monkey kidney **epithelial** cell line with the **BARF1** open reading frame from Epstein-Barr virus.
AUTHOR: Wei Ming Xin; Turenne-Tessier Mireille De; Decaussin Gisele; Benet Gerard; Ooka Tadamasa(a)

AUTHOR ADDRESS: (a)Lab. Virol. Mol., IVMC, UMR 5537 CNRS, Fac. Med. R, Laennec, Rue Guillaume Paradin, 69372 Lyon C**France
JOURNAL: Oncogene 14 (25):p3073-3081 1997
ISSN: 0950-9232
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: We previously reported that the **BARF1** (BamH1-A right frame 1) gene product from Epstein-Barr Virus (EBV) may have oncogenic properties since injection into new-born rats of transfected cell lines resulted in the development of **BARF1** expressing tumors, which were aggressive in the case of murine fibroblasts and transient in that of human B lymphocytes. As EBV has been associated with **nasopharyngeal** carcinoma (**NPC**) and evidence of **BARF1** transcription in this cancer was emerging from our biopsy analyses, we examined the effects of **BARF1** transfection into primate primary **epithelial** cells. The expression of the **BARF1** open reading frame in primary monkey kidney **epithelial** cells led us to the establishment of continuously dividing lines. The **BARF1** transfectants showed the major characteristics of immortalized cells: morphological change, short cell doubling time, ability to divide at low cell density and continuous growth over 50 passages. Injection of **BARF1** transfectants into nude mice did not induce any tumor. Established subclones were shown to be **epithelial** cells expressing known keratins as well as the **BARF1** coded mRNA and protein. This is the first report indicating that expression of the **BARF1** gene product in primary **epithelial** cells may contribute to the establishment of cell lines.

4/7/11 (Item 11 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10745514 BIOSIS NO.: 199799366659
Antibody and antibody-dependent cellular cytotoxicity responses against the BamHI A rightward open-reading frame-1 protein of Epstein-Barr virus (EBV) in EBV-associated disorders.
AUTHOR: Tanner J E; Wei M X; Alfieri C; Ahmad A; Taylor P; Ooka T; Menezes J(a)
AUTHOR ADDRESS: (a)Lab. Immunovirol., Pediatric Res. Cent., Ste-Justine Hosp., 3175 Cote-Ste-Catherine, Montreal, Q**Canada
JOURNAL: Journal of Infectious Diseases 175 (1):p38-46 1997
ISSN: 0022-1899
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Antibody-dependent cellular cytotoxicity (ADCC) is an important antiviral effector mechanism. ADCC to the protein encoded by the Epstein-Barr virus (EBV) BamHI A rightward open-reading frame-1 (**BARF1**) was studied by transducing Raji-tk- cells with the **BARF1** gene using a retroviral expression vector. The transduced Raji cells expressed **BARF1** on the cell surface, as determined by flow cytometry. Sera from chronic and acute infectious mononucleosis and **nasopharyngeal** carcinoma patients were found to contain antibodies that react with the **BARF1** protein. When **BARF1**-expressing Raji cells were used as targets for ADCC, sera from several **nasopharyngeal** carcinoma patients demonstrated significant ADCC reactivity, whereas sera from healthy EBV-seronegative and -seropositive persons lacked such reactivity. **BARF1**-specific ADCC activity could be competitively inhibited with recombinant **BARF1** protein. The level of anti-**BARF1** antibody activity in sera of patients with EBV-associated diseases suggests that the **BARF1** protein may serve

as a target on EBV-infected cells for ADCC.

4/7/13 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06651219 Genuine Article#: ZH268 Number of References: 60
Title: The Epstein-Barr virus **BARF1** gene encodes a novel, soluble colony-stimulating factor-1 receptor
Author(s): Strockbine LD; Cohen JI; Farrah T; Lyman SD; Wagener F; DuBose RF; Armitage RJ; Spriggs MK (REPRINT)
Corporate Source: IMMUNEX RES & DEV CORP,MOL BIOL, 51 UNIV ST/SEATTLE//WA/98101 (REPRINT); IMMUNEX RES & DEV CORP,MOL BIOL/SEATTLE//WA/98101; NIAID,CLIN INVEST LAB, NIH/BETHESDA//MD/20892
Journal: JOURNAL OF VIROLOGY, 1998, V72, N5 (MAY), P4015-4021
ISSN: 0022-538X Publication date: 19980500
Publisher: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW, WASHINGTON, DC 20005-4171
Language: English Document Type: ARTICLE
Abstract: Epstein-Barr virus (EBV) is a ubiquitous herpesvirus associated with infectious mononucleosis and several tumors. The **BARF1** gene is transcribed early after EBV infection from the BamHI A fragment of the EBV genome. Evidence shown here indicates that the **BARF1** protein is secreted into the medium of transfected cells and from EBV-carrying B cells induced to allow lytic replication of the virus. Expression cloning identified colony-stimulating factor-1 (CSF-1) as a ligand for **BARF1**, Computer-assisted analyses indicated that subtle amino acid sequence homology exists between **BARF1** and c-fms, the cellular proto-oncogene that is the receptor for CSF-1. Recombinant **BARF1** protein was found to be biologically active, and it neutralized the proliferative effects of human CSF-1 in a dose-dependent fashion when assayed in vitro. Since CSF-1 is a pleiotropic cytokine best known for its differentiating effects on macrophages, these data suggest that **BARF1** may function to modulate the host immune response to EBV infection.

4/7/14 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03058166 Genuine Article#: ND238 Number of References: 31
Title: EXPRESSION AND TUMORIGENICITY OF THE EPSTEIN-BARR-VIRUS **BARF1** GENE IN HUMAN LOUCKES B-LYMPHOCYTE CELL-LINE
Author(s): WEI MX; MOULIN JC; DECAUSSIN G; BERGER F; OOKA T
Corporate Source: UNIV CLAUDE BERNARD,FAC MED ALEXIS CARREL,CNRS,IVMC,VIROL MOLEC LAB,RUE G PARADIN/F-69372 LYON 08//FRANCE/; UNIV CLAUDE BERNARD,FAC MED ALEXIS CARREL,CNRS,IVMC,VIROL MOLEC LAB,RUE G PARADIN/F-69372 LYON 08//FRANCE/; PASTEUR MERIEUX/F-69280 MARCY LETOILE//FRANCE/; HOP EDOUARD HERRIOT,SERV ANATOMOPATHOL/F-69374 LYON 08//FRANCE/
Journal: CANCER RESEARCH, 1994, V54, N7 (APR 1), P1843-1848
ISSN: 0008-5472
Language: ENGLISH Document Type: ARTICLE
Abstract: We previously showed that the Epstein-Barr virus, which encodes the **BARF1** gene, could transform rodent fibroblasts. In this work, the expression of the **BARF1** gene was studied in the human Louckes B-lymphocyte cell line. Introduction of the **BARF1** open reading frame under the control of the Mo-MuLV LTR promotor into nontumorigenic Louckes lymphoid cells led to the activation of the c-myc protooncogene and increased expression of the B-cell surface proteins, the

2/7/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

12522429 BIOSIS NO.: 200000275931
Unique transcription pattern of Epstein-Barr virus (EBV) in EBV-carrying gastric adenocarcinomas: Expression of the transforming **BARF1** gene.
AUTHOR: zur Hausen Axel; Brink Antoinette A T P; Craanen Mikael E; Middeldorp Jaap M; Meijer Chris J L M; van den Brule Adriaan J C(a)
AUTHOR ADDRESS: (a)Department of Pathology, Section Molecular Pathology, University Hospital Vrije Universiteit, 1007 MB, Amsterdam**Netherlands
JOURNAL: Cancer Research 60 (10):p2745-2748 May 15, 2000
MEDIUM: print.
ISSN: 0008-5472
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

ABSTRACT: Approximately 10% of gastric adenocarcinomas worldwide are associated with human EBV. These carcinomas generally do not express the latent membrane protein 1 (LMP1), the major known EBV oncogene. Recently, another EBV gene (i.e., **BARF1** (BamHI A rightward open reading frame)) was shown to have transforming and immortalizing capacities. Therefore, in this study, we investigated the expression of **BARF1** in EBV-carrying gastric adenocarcinomas in relation to the expression of other latent EBV transcripts. In the present study, 10 of 132 gastric adenocarcinomas tested positive for EBV using EBER1/2-RNA in situ hybridization. We demonstrate **BARF1** gene transcription in nine EBV-carrying gastric adenocarcinomas (with sufficient RNA quality) using the **BARF1**-specific nucleic acid sequence-based amplification assay. In addition, we also detected other latent EBV transcripts (i.e., BARF0-, LMP2A-, and Q/K-driven **EBNA1** transcripts in these carcinomas using reverse transcription-PCR analysis. No expression of LMP1, EBNA2, and ZEBRA (either at transcription or protein level) was found. In addition, two cases were positive for BHRF1 transcripts, the viral bcl-2 homologue. Thus, together with **BARF1** transcription, a unique and distinct EBV latency type has been found in EBV-associated gastric adenocarcinomas. Because **BARF1** exerts immortalizing effects on human epithelial cells in vitro and EBV-carrying gastric adenocarcinomas lack the expression of LMP1, the **BARF1** gene might act as the viral oncogene in EBV-carrying gastric carcinomas. The **BARF1** gene offers an alternative way for EBV-mediated oncogenesis other than LMP1.

2/7/3 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

12511243 BIOSIS NO.: 200000264745
Expression of the transforming Epstein-Barr virus **BARF1** gene in EBV-carrying gastric adenocarcinomas.
AUTHOR: van den Brule Adriaan J(a); zur Hausen Axel; Brink Antoinette A; Craanen Mikael E; Middeldorp Jaap M; Meijer Chris J
AUTHOR ADDRESS: (a)Dept of Pathology, Free Univ Amsterdam, Amsterdam** Netherlands
JOURNAL: Gastroenterology 118 (4 Suppl. 2 Part 1):pA60 April, 2000
MEDIUM: print.
CONFERENCE/MEETING: 101st Annual Meeting of the American Gastroenterological Association and the Digestive Disease Week. San Diego, California, USA May 21-24, 2000
SPONSOR: American Gastroenterological Association

ISSN: 0016-5085
RECORD TYPE: Citation
LANGUAGE: English
SUMMARY LANGUAGE: English

2/7/4 (Item 4 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11708757 BIOSIS NO.: 199800490488
Nucleic acid sequence-based amplification, a new method for analysis of spliced and unspliced Epstein-Barr virus latent transcripts, and its comparison with reverse transcriptase PCR.
AUTHOR: Brink Antoinette A T P; Vervoort Marcel B H J; Middeldorp Jaap M; Meijer Chris J L M; Van Den Brule Adriaan J C(a)
AUTHOR ADDRESS: (a)Sect. Mol. Pathol., Dep. Univ. Hosp. Vrije Univ., P.O. Box 7057, 1007 MB Amsterdam**Netherlands
JOURNAL: Journal of Clinical Microbiology 36 (11):p3164-3169 Nov., 1998
ISSN: 0095-1137
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Nucleic acid sequence-based amplification (NASBA) assays were developed for direct detection of Epstein-Barr virus (EBV) transcripts encoding EBV nuclear antigen 1 (**EBNA1**), latent membrane proteins (LMP) 1 and 2, and BamHIA rightward frame 1 (**BARF1**) and for the noncoding EBV early RNA 1 (EBER1). The sensitivities of all NASBAs were at least 100 copies of specific in vitro-generated RNA. Furthermore, 1 EBV-positive JY cell in a background of 50,000 EBV-negative Ramos cells (the relative sensitivity) was detected by using the **EBNA1**, LMP1, and LMP2 NASBA assays. The relative sensitivity of the EBER1 NASBA was 100 EBV-positive cells, which was probably related to the loss of small RNA molecules during the isolation. The **BARF1** and LMP2 NASBAs were evaluated on clinical material. **BARF1** expression was found in 6 of 7 nasopharyngeal carcinomas (NPC) but in 0 of 22 Hodgkin's disease (HD) cases, whereas LMP2 expression was found in 7 of 7 NPCs and in 17 of 22 HD cases. For detection of **EBNA1** transcripts in HLs (n = 12) and T- and B-cell non-Hodgkin's lymphomas (n = 3 and n = 2, respectively), NASBA was compared with reverse transcriptase (RT) PCR. Two samples were positive only with NASBA, and two other samples were positive only with RT-PCR; for all other samples, the RT-PCR and NASBA results were in agreement. We conclude that NASBA is suitable for sensitive and specific detection of the above-mentioned EBV transcripts, regardless of their splicing patterns and the presence of EBV DNA. The **EBNA1**, LMP2, and **BARF1** NASBAs developed in this study proved to be reliable assays for detection of the corresponding transcripts in EBV-positive clinical material.

2/7/5 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

08668991 Genuine Article#: 314MJ Number of References: 34
Title: Unique transcription pattern of Epstein-Barr virus (EBV) in EBV-carrying gastric adenocarcinomas: Expression of the transforming **BARF1** gene
Author(s): zurHausen A; Brink AATP; Craanen ME; Middeldorp JM; Meijer CJLM; vandenBrule AJC (REPRINT)
Corporate Source: FREE UNIV AMSTERDAM HOSP,DEPT PATHOL, SECT MOL PATHOL,

POB 7057/NL-1007 MB AMSTERDAM//NETHERLANDS/ (REPRINT); FREE UNIV AMSTERDAM HOSP,DEPT PATHOL, SECT MOL PATHOL/NL-1007 MB AMSTERDAM//NETHERLANDS/; FREE UNIV AMSTERDAM HOSP,DEPT GASTROENTEROL/NL-1007 MB AMSTERDAM//NETHERLANDS/

Journal: CANCER RESEARCH, 2000, V60, N10 (MAY 15), P2745-2748
ISSN: 0008-5472 Publication date: 20000515
Publisher: AMER ASSOC CANCER RESEARCH, PO BOX 11806, BIRMINGHAM, AL 35202
Language: English Document Type: ARTICLE

Abstract: Approximately 10% of gastric adenocarcinomas worldwide are associated with human EBV, These carcinomas generally do not express the latent membrane protein 1 (LMP1), the major known EBV oncogene,

Recently, another EBV gene [i.e., **BARF1** (BamHI A rightward open reading frame)] was shown to have transforming and immortalizing capacities, Therefore, in this study, we investigated the expression of **BARF1** in EBV-carrying gastric adenocarcinomas in relation to the expression of other latent EBV transcripts.

In the present study, 10 of 132 gastric adenocarcinomas tested positive for EBV using EBER1/2-RNA in situ hybridization, We demonstrate **BARF1** gene transcription in nine EBV-carrying gastric adenocarcinomas (with sufficient RNA quality) using the **BARF1** -specific nucleic acid sequence-based amplification assay. In addition, we also detected other latent EBV transcripts (i.e., BARF0-, LMP2A-, and Q/K-driven **EBNA1** transcripts in these carcinomas using reverse transcription-PCR analysis. No expression of LMP1, EBNA2, and ZEBRA (either at transcription or protein level) was found. In addition, two cases were positive for BHRF1 transcripts, the viral bcl-2 homologue, Thus, together with **BARF1** transcription, a unique and distinct EBV latency type has been found in EBV-associated gastric adenocarcinomas.

Because **BARF1** exerts immortalizing effects on human epithelial cells in vitro and EBV-carrying gastric adenocarcinomas lark the expression of LMP1 the **BARF1** gene might act as the viral oncogene in EBV-carrying gastric carcinomas. The **BARF1** gene offers an alternative way for EBV-mediated oncogenesis other than LMP1.

2/7/6 (Item 1 from file: 76)
DIALOG(R)File 76:Life Sciences Collection

02492243 4737903
Unique Transcription Pattern of Epstein-Barr Virus (EBV) in EBV-carrying Gastric Adenocarcinomas: Expression of the Transforming **BARF1** Gene
Hausen, A.Z.; Brink, A.A.T.P.; Craanen, M.E.; Middeldorp, J.M.; Meijer, C.J.L.M.; van den Brule, A.J.C.
Department of Pathology, Section Molecular Pathology, University Hospital Vrije Universiteit, P.O. Box 7057, 1007 MB Amsterdam, the Netherlands
Cancer Research vol. 60, no. 10, pp. 2745-2748 (2000)
ISSN: 0008-5472
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Virology & AIDS Abstracts

Approximately 10% of gastric adenocarcinomas worldwide are associated with human EBV. These carcinomas generally do not express the latent membrane protein 1 (LMP1), the major known EBV oncogene. Recently, another EBV gene [i.e., **BARF1** (BamHI A rightward open reading frame)] was shown to have transforming and immortalizing capacities. Therefore, in this study, we investigated the expression of **BARF1** in EBV-carrying gastric adenocarcinomas in relation to the expression of other latent EBV

transcripts. In the present study, 10 of 132 gastric adenocarcinomas tested positive for EBV using EBER1/2-RNA in situ hybridization. We demonstrate **BARF1** gene transcription in nine EBV-carrying gastric adenocarcinomas (with sufficient RNA quality) using the **BARF1**-specific nucleic acid sequence-based amplification assay. In addition, we also detected other latent EBV transcripts (i.e., BARF0-, LMP2A-, and Q/K-driven **EBNA1** transcripts in these carcinomas using reverse transcription-PCR analysis. No expression of LMP1, EBNA2, and ZEBRA (either at transcription or protein level) was found. In addition, two cases were positive for BHRF1 transcripts, the viral bcl-2 homologue. Thus, together with **BARF1** transcription, a unique and distinct EBV latency type has been found in EBV-associated gastric adenocarcinomas. Because **BARF1** exerts immortalizing effects on human epithelial cells in vitro and EBV-carrying gastric adenocarcinomas lack the expression of LMP1, the **BARF1** gene might act as the viral oncogene in EBV-carrying gastric carcinomas. The **BARF1** gene offers an alternative way for EBV-mediated oncogenesis other than LMP1.

04273985 H.W. WILSON RECORD NUMBER: BGSA00023985 (THIS IS THE FULLTEXT)
Role of cytotoxic T lymphocytes in Epstein-Barr virus-associated diseases.
Khanna, Rajiv
Burrows, Scott R
Annual Review of Microbiology v. 54 (2000), p. 19-48
LANGUAGE: English
COUNTRY OF PUBLICATION: United States
WORD COUNT: 11989

ABSTRACT: Adaptation of persistent infection within the cells of the immune system is a unique characteristic of gamma herpes viruses. A classic example of this is Epstein-Barr virus (EBV), which may have co-evolved with Homo sapiens over millions of years, thus achieving a balance between viral persistence and immune control. In this review, we present an overview of virus and the host immune system interactions that regulate the life-long host-virus relationship in healthy virus carriers and EBV-associated diseases. Extensive analysis of cytotoxic T lymphocyte-mediated immune responses in healthy virus carriers has revealed unique mechanisms used by EBV to maintain a benign persistent state in vivo. On the other hand, this relationship in EBV-associated diseases favors the escape of the virus from the hostile effects of the immune response. This escape is achieved by either down-regulating the expression of highly immunogenic antigens of the virus or by direct modulation of the host cytotoxic T lymphocyte response by virus-encoded proteins. Reprinted by permission of the publisher.

TEXT:

Key Words latency, lymphoma, immumodulation, epitope, immune escape, immunotherapy

INTRODUCTION

Epstein-Barr virus (EBV) is the best known and most widely studied herpes virus, owing to its clinical and oncogenic importance. Although EBV was the first virus implicated in a human cancer, its ubiquitous prevalence in diverse human populations made it difficult to firmly establish the link between this virus and lymphomas. In early 1964, Epstein and colleagues reported that they could continuously culture cells from a Burkitt's lymphoma (BL) patient, and, using electron microscopy, they identified a herpes viral particle (19). This finding was the culmination of years of epidemiological, cell biology, and electron microscopic studies. In fact,

transferrin receptor, CD21, and CD23. **BARF1**-expressing cells induced a diffuse lymphoma-like tumor in newborn rats treated with anti-thymocyte serum that was, however, transient and regressed after 3-4 weeks as the immune system recovered. The tumor induction was similar to that observed with lymphoid cell lines in vitro generated by infection with the B95-8 virus strain, in which lytic antigens are expressed at low levels. After long-term culture, Louckes cell clones lost expression of the **BARF1** gene and were unable to induce tumors.

4/7/17 (Item 2 from file: 76)
DIALOG(R)File 76:Life Sciences Collection

02217680 4231116
Expression of the protein encoded by Epstein-Barr virus (EBV) **BARF1** open reading frame from a recombinant adenovirus system
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VIRUS RES. vol. 52, no. 1, pp. 73-85 (1997)
ISSN: 0168-1702
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Virology & AIDS Abstracts

Epstein-Barr virus (EBV) has been associated with human cancers of lymphocytic or **epithelial** origin, but viral functions implied in oncogenesis are not yet clear. We previously reported the oncogenic transformation of rodent fibroblast and human B lymphocyte cell lines by the **BARF1** coding sequence from EBV. We more recently observed immortalizing effects of this gene on monkey kidney primary **epithelial** cells. Here we describe an efficient recombinant adenovirus expression system which allowed us to characterize **BARF1** translation products, with the help of rabbit polyclonal antibodies raised to the entire protein. The present data demonstrate that **BARF1** encodes a 31-33 kDa hydrophobic protein, linked to cell membranes though also recovered in the cytosol, and recognized by human sera from patients with various EBV-related pathologies.
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